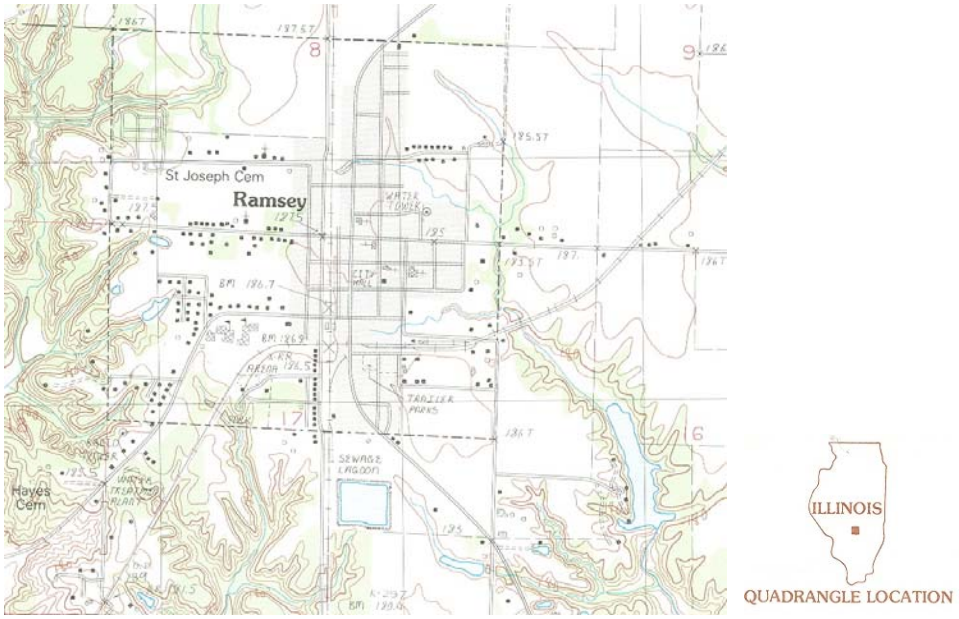
Midwest Technology Assistance Center
Groundwater Resource Assessment for Small Communities

Groundwater Availability
At
Ramsey, Illinois
(Fayette County)

Project Overview
This project is an outgrowth of the Public Service Program of the Center for Groundwater Science (CGS) at the Illinois State Water Survey. For over 50 years, the CGS has provided groundwater information to any requesting individual, commercial facility or public water facility. Groundwater resource assessments have been an integral part of this public service and have been undertaken for thousands of individuals and facilities throughout its history. Community groundwater supplies that have been identified as potentially "deficient" are the targets for this project. The criterion used for determining community deficiency were; 1) Water Supply and Demand (operating time), 2) Aquifer Limitation, 3) Well Specific Capacity, and 4) Facility History. The Village of Ramsey has been identified as a target community for groundwater assessment through this project.

Project Goal
To provide a resource tool of pertinent groundwater information to each target facility. This document describes a summary of historic information, current conditions and the potential for expansion of the water supply within 5 and 10 miles of Ramsey.

Ramsey (Fayette County)



The Village of Ramsey (Facility Number 0510200) obtains its water from one active community water supply well. Well #7 (Illinois EPA #01076) supplies an average of 116,380 gallons per day (gpd) to 470 direct services or a population of 1,000, and 1 satellite service (Ramsey Lake State Park).

The project criterion ranked Ramsey as “marginal” mainly due to its shallow water table well, a long history of searching for the minimal groundwater supply currently utilized, and the problems associated with those searches due to the highly variable sand formations found throughout this area.

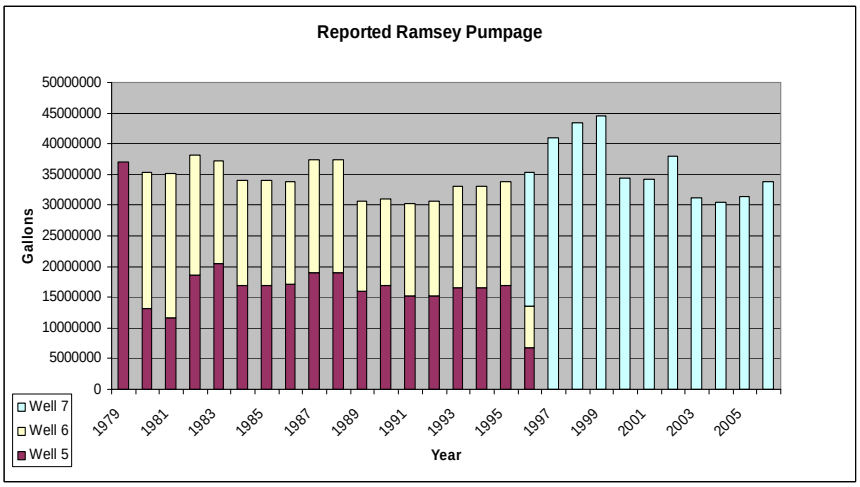
Historic Information

Background Well Information

Well No.6 (Emergency Well)
Finished in shallow sand and gravel deposits located in Section 18, T.8N., R.1E., Fayette County. The well was drilled to a depth of 41 feet in 1980 and, upon completion, reportedly produced 150 gpm for 2 hours with 6.9 feet of drawdown. Calculated specific capacity from this test was 21.6 gpm/ft. Static water level was reported as 18.40 feet below land surface.

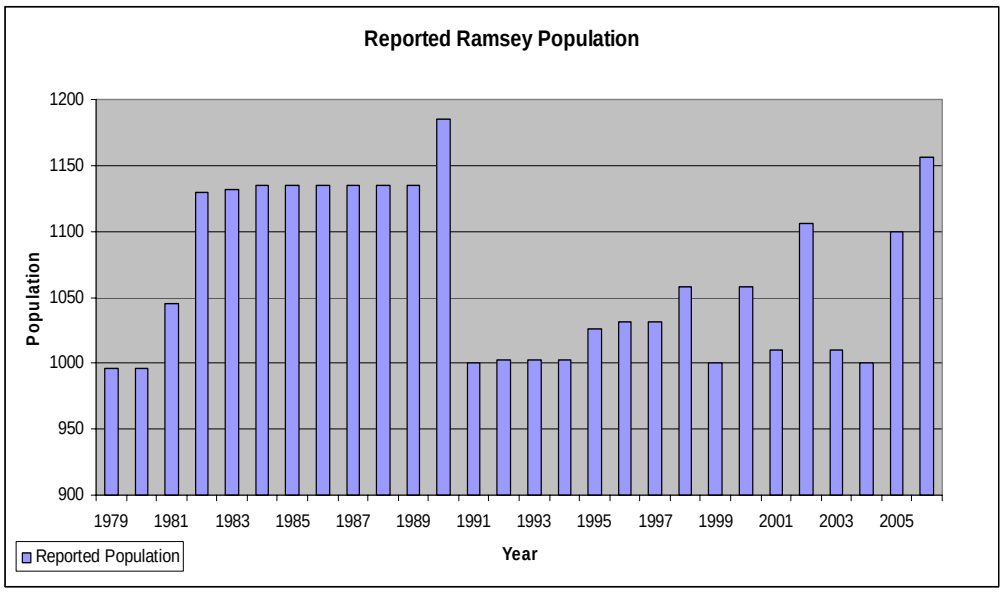
Well No.7
Finished in coarse sand and gravel associated with the Kaskaskia River, is located in the Northwest quarter of Section 32, T.8N., R.2E., Fayette County. The well was drilled to a depth of 45 feet in 1995 and, upon completion, produced over 400 gallons per minute (gpm) for a 22 hours with approximately 16ft of drawdown. Calculated specific capacity from this test was 25.8 gpm/ft. Static water level was reported as 8.5 feet below land surface.

Background Pumpage Information



Source: ISWS Illinois Water Inventory Program

Historic Population Information



Source: ISWS Illinois Water Inventory Program

Regional Information

Resources within 5 miles of Ramsey (Figure 1).

Domestic Groundwater Supplies

The available regional data indicate that groundwater for domestic and farm use in the old well field area (Section 18, T.8N., R.1E.) is obtained from large-diameter dug and bored wells finished in the unconsolidated materials above bedrock and from small-diameter drilled wells tapping the shallow underlying bedrock formations. The large-diameter dug and bored wells tap stringers or lenses of silt, sand, or gravel only a few inches thick contained in the unconsolidated materials above bedrock. They range in depth from about 9 to 73 feet. The yield of this type of well is limited to a few hundred gallons per day and may be only barely adequate for normal household uses.

A few small-diameter (4- to 6-inch) wells in the area have been drilled into the underlying Pennsylvanian bedrock. These wells tap thin sandstone formations found in the upper bedrock and range in depth from about 72 to 117 feet. Upon completion, these wells were pumped at rates of 1 to 5 gallons per minute for short periods of time.

The available regional data indicate that groundwater for domestic and farm use in the new well field area (Section 32, T.8N., R.2E.) is obtained from large-diameter dug and bored wells and from small-diameter drilled wells finished in the unconsolidated materials above bedrock. The large-diameter dug and bored wells tap stringers or lenses of silt, sand, or gravel only a few inches thick contained in the unconsolidated materials above bedrock. They range in depth from about 14 to 65 feet. The yield of this type of well is limited to a few hundred gallons per day and may be only barely adequate for normal household uses. The small-diameter (4- to 6-inch) wells in the area have been drilled into sand and gravel deposits found within the unconsolidated materials above bedrock. These wells range in depth from about 33 to 96 feet below land surface.

Municipal Groundwater Supplies

There are two towns located within five miles of Ramsey; the Village of Bayle City to the west, and the Village of Hanson to the north. Neither town reports a municipal water supply and it is assumed that the residents use domestic wells for their water needs.

Resources within 10 miles of Ramsey (Figure 2).

Municipal Groundwater Supplies

Towns within 5 to 10 miles of Ramsey include: Bringham, Dean Hills, Island Hill, and Vera, in Fayette County; Fillmore and Bald Knob in Montgomery County; and Oconee and Herrick, in Shelby County. Only the towns of Fillmore (Montgomery Co.) and Herrick (Shelby Co.) report the use of groundwater for their municipal needs.

The Village of Fillmore currently uses three wells, two of which (Wells 2 and 4) are located in Section 24, T.8N., R.2W. Montgomery County, and one well (Well 3) is located in Section 20, T.8N., R.1W., Fayette County. These wells are finished in sand and gravel at depths ranging from 38 and 68 feet below land surface and are currently pumped at rates of around 20 gpm for the village needs.

The Village of Herrick currently uses two wells located in Sections 25 and 26, T.9N., R.2E., Shelby county. The wells are finished in sand and gravel associated with Mitchell Creek at depths of 78 and 80 feet below land surface. Current information indicates these wells are pumped at rates around 50 gpm for the village needs.

Figures 3 and 4 picture the ISWS Potential Yield maps for sand and gravel and bedrock aquifer in Illinois, respectively. The pertinent counties for Ramsey are highlighted. Figure 3 indicates that sand and gravel deposits are variable throughout the Ramsey area but are more structured to the southeast along the

Kaskaskia River. The Village currently uses one well from these alluvial river deposits. The bedrock map (Figure 4) indicates poor availability of groundwater from the bedrock throughout the Ramsey area. Figures 5 and 6 present the probability of occurrence of the sand and gravel and the water-yielding character of the shallow bedrock for the Ramsey area as depicted in the Illinois State Geologic Survey Circular 225, *Groundwater Geology in South-Central Illinois* (Selkregg, et al., 195).

Figure 5 indicates "Fair to Good," variable and discontinuous sand and gravel deposits and Figure 6 indicates only small supplies are available from the shallow bedrock units. The domestic well construction records verify these map outlooks.

Groundwater Availability Summary

All the test drilling and previous production wells for the village were developed in sand and gravel deposits to the west of town associated with Ramsey Creek. These wells furnished the village needs for many years; however, the sands and gravels proved very limited for long-term usage and caused considerable problems during their history. In 1995 the village explored the sands and gravels to the southeast along the Kaskaskia River. Well No. 7 currently supplies the village needs from these deposits. Well No. 6 is used as an emergency well.

The available information indicates that the sand and gravel deposits that the Village currently uses in the Kaskaskia River bottoms are capable of supplying the current needs of the town; however, should the village want to increase their water supply, additional well development in this area is recommended. Well 6 located west of town seems capable of supplying groundwater on an emergency basis and should be kept at this status. Any new development should be along the Kaskaskia River where the deposits are thicker and more reliable.

Figure 1. 5-mile radius map- Ramsey

Figure 2. 10-mile radius map- Ramsey

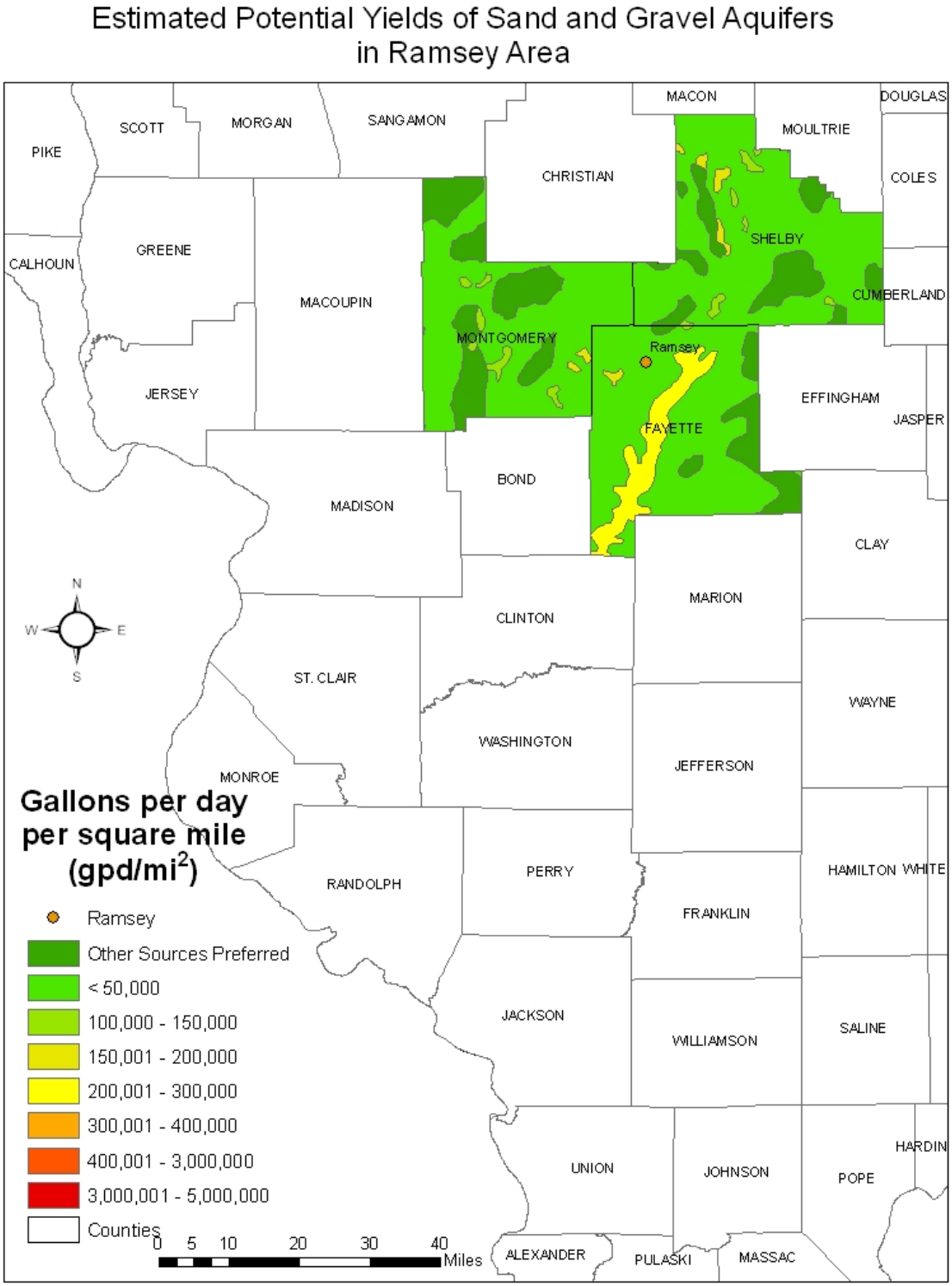

Estimated Potential Yields of Sand and Gravel Aquifers in Ramsey Area
PIKE
SCOTT
MORGAN
SANGAMON
MACON
DOUGLAS
MOULTRIE
CHRISTIAN
COLES
SHELBY
GREENE
CALHOUN
MACOUPIN
CUMBERLAND
MONTGOMERY
Ramsey
JERSEY
EFFINGHAM
JASPER
FAYETTE
BOND
MADISON
CLAY
N
W
E
S
MARION
CLINTON
ST. CLAIR
WAYNE
WASHINGTON
JEFFERSON
MONROE
Gallons per day per square mile (gpd/mi2)
RANDOLPH
PERRY
HAMILTON
WHITE
FRANKLIN
Ramsey
Other Sources Preferred
< 50,000
100,000 - 150,000
150,001 - 200,000
200,001 - 300,000
300,001 - 400,000
400,001 - 3,000,000
3,000,001 - 5,000,000
Counties
JACKSON
WILLIAMSON
SALINE
UNION
JOHNSON
HARDIN
POPE
0 5 10 20 30 40
Miles
ALEXANDER
PULASKI
MASSAC

Figure 3.

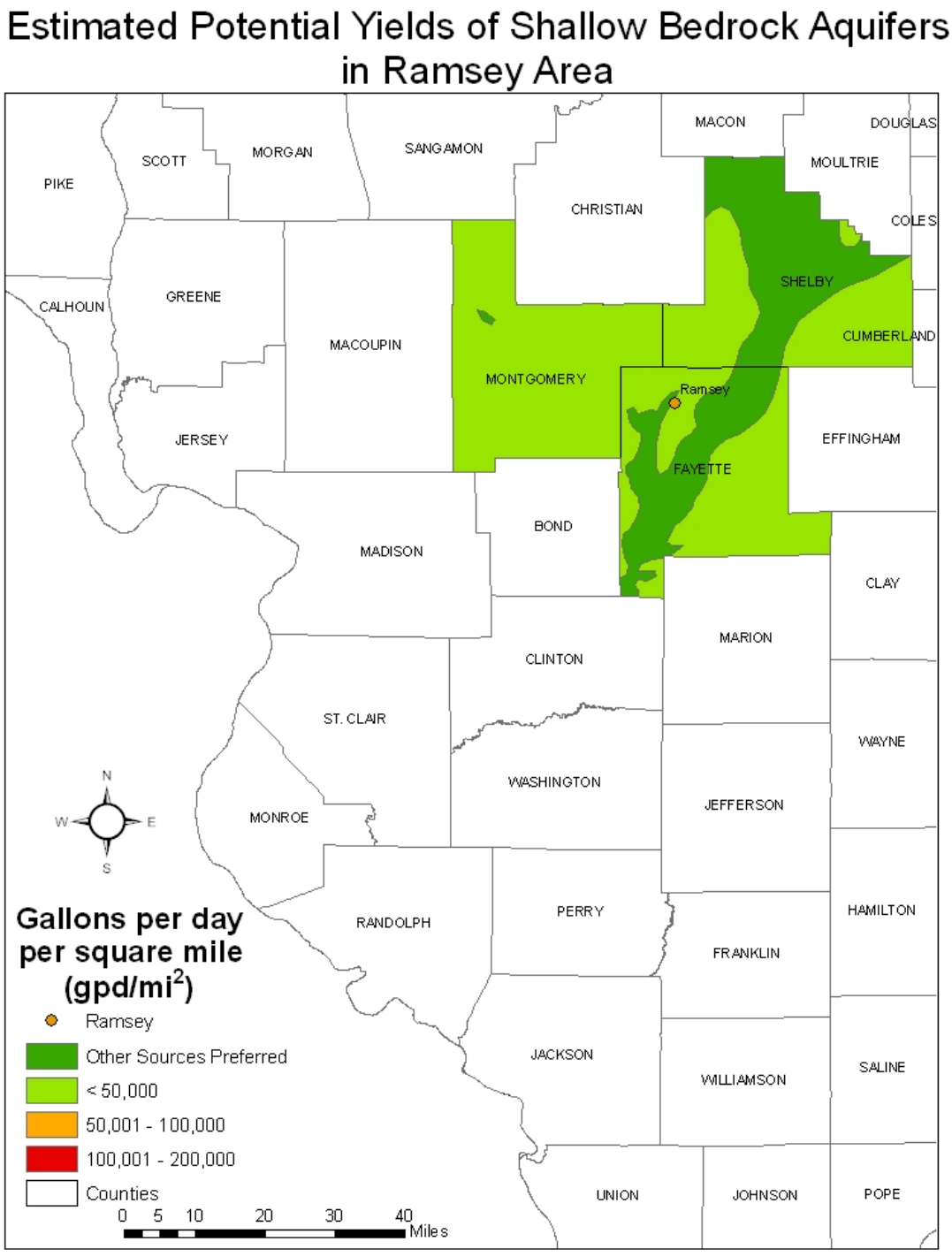

Estimated Potential Yields of Shallow Bedrock Aquifers in Ramsey Area
PIKE
SCOTT
MORGAN
SANGAMON
MACON
DOUGLAS
MOULTRIE
CHRISTIAN
COLES
SHELBY
CALHOUN
GREENE
MACOUPIN
CUMBERLAND
MONTGOMERY
Ramsey
JERSEY
EFFINGHAM
FAYETTE
BOND
MADISON
CLAY
MARION
CLINTON
ST. CLAIR
WAYNE
WASHINGTON
JEFFERSON
MONROE
RANDOLPH
PERRY
HAMILTON
FRANKLIN
JACKSON
WILLIAMSON
SALINE
UNION
JOHNSON
POPE
N
W
E
S
Gallons per day per square mile (gpd/mi2)
Ramsey
Other Sources Preferred
< 50,000
50,001 - 100,000
100,001 - 200,000
Counties
0 5 10 20 30 40
Miles

Figure 4.

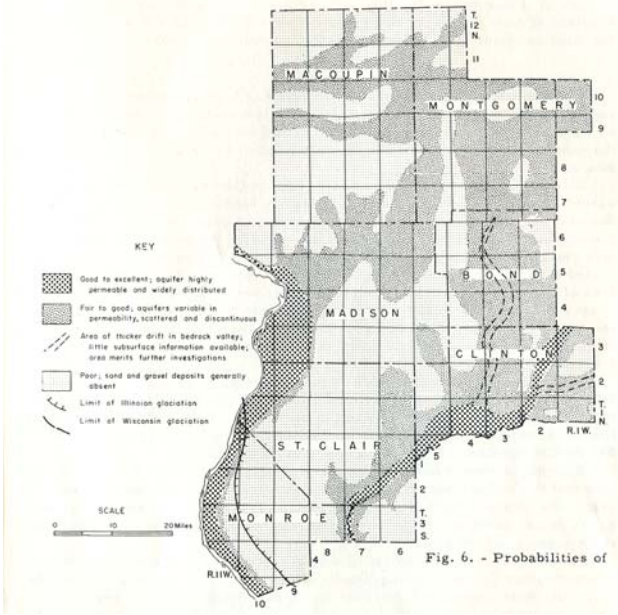


Fig. 6. - Probabilities of occurrence of sand and gravel aquifers.

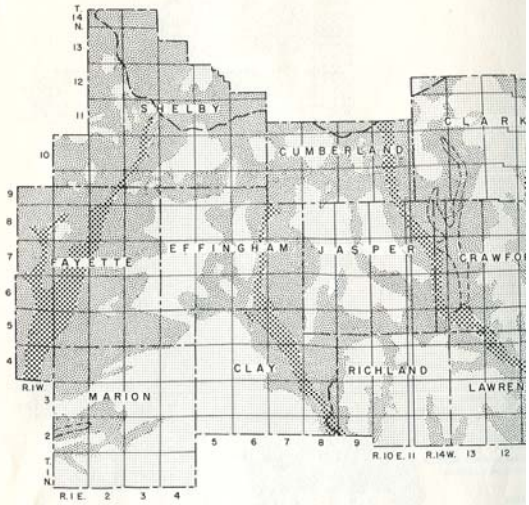


Figure 5.

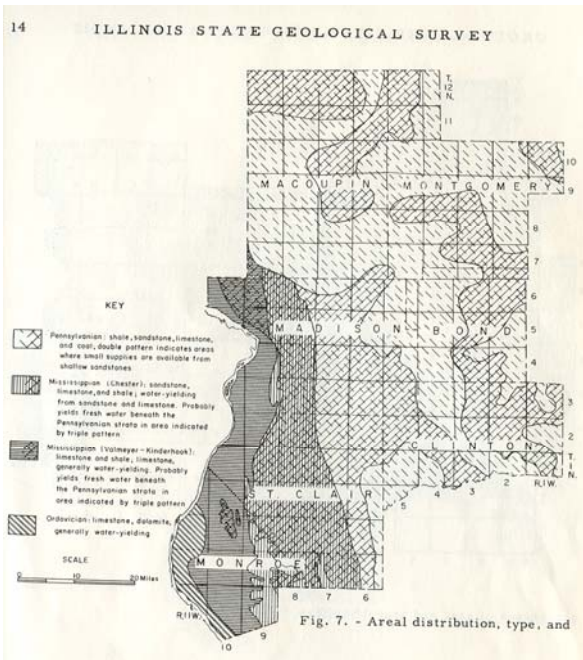


Fig. 7. - Areal distribution, type, and water-yielding character of upper bedrock formations.

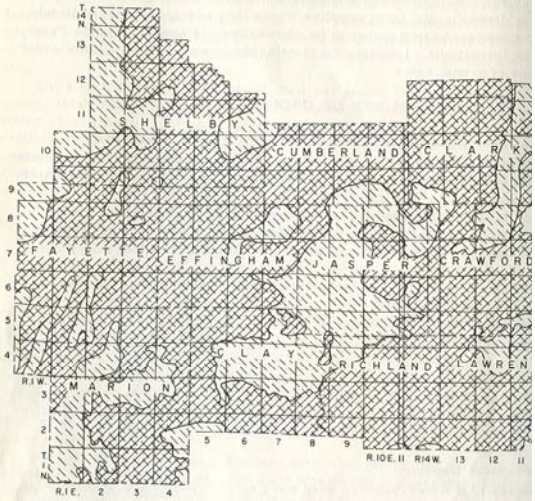


Figure 6.

References

Selkregg, L.F., W. A. Pryor, and J. Kempton. 1957. Groundwater Geology In South-Central Illinois, A preliminary Geologic Report. Illinois State Geological Survey Circular 225.

ISWS publications list for the Ramsey and surrounding areas.

FAYETTE

*1965	RI-53	Potential yield of aquifers in Embarras River Basin, Illinois. Walton-Csallany. Open File Report.
1965	RS-48	Relationship between water use and population in the Embarras River Basin, Illinois. Csallany.
*1966	RI-55	Yields of wells in Pennsylvanian and Mississippian rocks in Illinois. Csallany. 42p.
*1969	RI-62	Groundwater resources of the buried Mahomet Bedrock Valley. Visocky-Schicht. 52p.
*1978	CR-196	Water supply alternatives for the city of Danville. Singh. 124p.
*1978	CR-199	Reconnaissance study of final cut impoundments. Gibb-Evans. 101p.
*1978	CR-209	Assessment of public groundwater supplies in Illinois. Visocky-Wehrmann-Kim- Ringler. 193p.
*1980	CR-237	Assessment of eighteen public groundwater supplies in Illinois. Wehrmann- Visocky-Burris-Ringler-Brower. 185p.
1982	COOP-8	Hydrogeologic evaluation of sand and gravel aquifers for municipal groundwater supplies in east-central Illinois. Kempton-Morse-Visocky. 59p.
1985	COOP-10	Geology, hydrology, and water quality of the Cambrian and Ordovician Systems in northern Illinois. Visocky-Sherrill-Cartwright. 136p.